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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/468,085	12/21/1999	MINORU MIYATAKE	Q57340	3194

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SUGHRUE MION ZINN MACPEAK & SEAS PLLC  
2100 PENNSYLVANIA AVENUE N W  
WASHINGTON, DC 20037

EXAMINER

CHUNG, DAVID Y

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/468,085

Applicant(s)

MIYATAKE ET AL.

Examiner

David Y. Chung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5,7,9 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 2,6,8 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

In view of the appeal brief filed on January 23, 2004, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 5 and 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al. (U.S. 5,825,543) in further view of Nerad et al. (U.S.**

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**5,585,035), West et al. (U.S. 4,685,771), Takeuchi et al. (U.S. 5,374,371), Kubota et al. (U.S. 6,365,239) and O'Callaghan et al. (U.S. 5,182,665).**

Ouderkirk et al. discloses an optical film with a disperse phase of polymeric particles disposed within a continuous birefringent matrix. Ouderkirk discloses that the indices of refraction of the continuous and disperse phases are substantially matched along a first of three mutually orthogonal axes, and are substantially mismatched along a second of three mutually orthogonal axes. Preferably in the mismatch direction, the indices of refraction differ by at least 0.07, and preferably in the match direction, the indices differ by less than 0.03. See column 7, lines 7-19.

In regards to the size, Ouderkirk et al. discloses that in applications where the optical body is to be used as a low loss reflective polarizer, the disperse phase particles will have a length that is greater than 2 times the wavelength. For the visible spectrum of light, this would mean a length of at least 0.8 microns. See column 9, lines 55-67. This is believed to be a diffusely reflecting polarizer based on column 4, lines 9-17. Ouderkirk et al. teaches that incident light polarized along a mismatched axis is scattered, resulting in significant diffuse reflection. These properties can be used to make optical films such as low loss reflective polarizers for which polarizations of light that are not significantly transmitted are diffusely reflected. Ouderkirk et al. teaches that if diffuse, rather than specular reflection is desired, the disperse phase particles should be sized less than several wavelengths of light. See column 10, lines 27-31. Webster's dictionary defines "several" as meaning "an indefinite number greater than two and less

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than many". Therefore, Ouderkirk et al. strongly implies a particles size significantly less than 500 microns. The particle size would have to be greater than 700 times the wavelength to be greater than the claimed range.

Even if the low loss reflective polarizer discussed above is not diffusive, Ouderkirk et al. teaches that disperse phase particles smaller than  $1/30$  the wavelength would result in very little light being scattered. See column 9, lines 29-36. Therefore, even if Ouderkirk et al. does not anticipate the claimed size range, Ouderkirk et al. does at least teach an overlapping range. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to size the disperse phase particles between 0.05 to 500 microns because Ouderkirk et al. teaches an overlapping range. See MPEP § 2131.03 and § 2144.05.

Even if Ouderkirk et al. does not have specific disclosures on the desired particle size, Ouderkirk et al. does teach that the size and shape of the disperse phase particles, the volume fraction of the disperse phase, the film thickness, and the amount of orientation are chosen to attain a desired degree of diffuse reflection. See abstract. The size of the disperse phase can have a significant effect on scattering. If the particles are too small, very little light is scattered. If the particles are too large, the light is specularly reflected with very little diffusion. See column 9, lines 29-39. Therefore, Ouderkirk et al. recognizes the size of the disperse phase particles to be a result effective variable. Therefore, even assuming that Ouderkirk et al. does not have specific disclosures on the desired particle size, it would have been obvious to one of ordinary skill in the art at the time of invention to make the particle size between 0.05 to

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500 microns since optimization of a result effective variable has been held to be obvious to those of ordinary skill in the art. See MPEP § 2144.05.

Even if Ouderkirk et al. has no disclose regarding the size of the disperse phase particles, it was well known that diffusing particles were required to be sized between 0.05 to 500 microns in order to scatter light effectively. Nerad et al. teaches that the preferred size of polymer dispersed liquid crystal droplets is about 0.1 to 10 times the wavelength of light to be scattered. See column 3, lines 42-51. West et al. teaches that efficient scattering useful for light scattering displays occurs as long as the size of the liquid crystal droplet is on the order of the wavelength of incident light, e.g., about 0.2-10 microns. See column 4, line 61 – column 5, line 5. Taeuchi et al. teaches that when using scattering particles that are too large or too small as compared with light wavelengths, light scattering cannot be achieved. See column 5, line 3-17. Kubota et al. teaches that a liquid crystal particle size from 0.8-2.5 microns can provide excellent scattering power. See column 46, lines 9-16. O'Callaghan et al. teaches that for efficient scattering, the liquid crystal droplet must be comparable in size to the light's wavelength. See column 2, lines 25-44. Therefore, it was clearly well known that disperse phase particles sized between 0.05 to 500 microns were necessary for forming an effective light scattering element. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to size the disperse phase particles in the directing of desired scattering to be between 0.05 to 500 microns because this was necessary to form an effective light scattering film even if Ouderkirk et al. does not disclose the size of the disperse phase particles.

As to claims 5 and 7, Ouderkirk et al. teaches forming a multi-layer combination by stacking several diffusing films in order to obtain a composite reflection within the same band having increased efficiency. See column 17, lines 20-42. In order to obtain a composite reflection within the same band, the match and mismatch directions of all of the various stacked films would have to be parallel.

**Claims 9 and 11-13 rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al. (U.S. 5,825,543) in further view of Nerad et al. (U.S. 5,585,035), West et al. (U.S. 4,685,771), Takeuchi et al. (U.S. 5,374,371), Kubota et al. (U.S. 6,365,239), O'Callaghan et al. (U.S. 5,182,665), and Omar et al. (U.S. 6,433,846).**

Ouderkirk et al. does not disclose forming an optical element by combining a polarizer. The diffusing film disclosed by Ouderkirk et al. can be a diffusely reflecting polarizer, or simply a reflective diffuser. For a reflective diffuser, it would have been obvious to one of ordinary skill in the art at the time of invention to add a polarizer so that the diffusing film could be utilized in an optical system such as a liquid crystal display. Note in figure 4 of Omar et al., the reflective diffuser 36 and the rear polarizer 12. The reflective diffuser 36 and rear polarizer 12 are attached to a liquid crystal cell.

***Allowable Subject Matter***

**Claims 2, 6, 8 and 10 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

The following is a statement of reasons for the indication of allowable subject matter: The prior art did not teach or suggest any motivation for combining the chemical structure of claim 2 to the disclosure of Ouderkirk et al. The prior art also did not teach making the transmission axis of the polarizing plate parallel to the match direction of the diffusing plate.

***Claim Objections***

Claim 7 objected to because of the following informalities: The claim is dependent upon a cancelled claim. Appropriate correction is required.

Claim 8 objected to because of the following informalities: The claim is a duplicate of claim 6. Appropriate correction is required.



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***Conclusion***

Any inquiry concerning this communication of earlier communications from the examiner should be directed to David Chung whose telephone number is (571) 272-2288. The examiner can normally be reached on Monday-Friday from 8:30 am to 5:00 pm.

  
ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

David Chung  
GAU 2871  
05/02/04